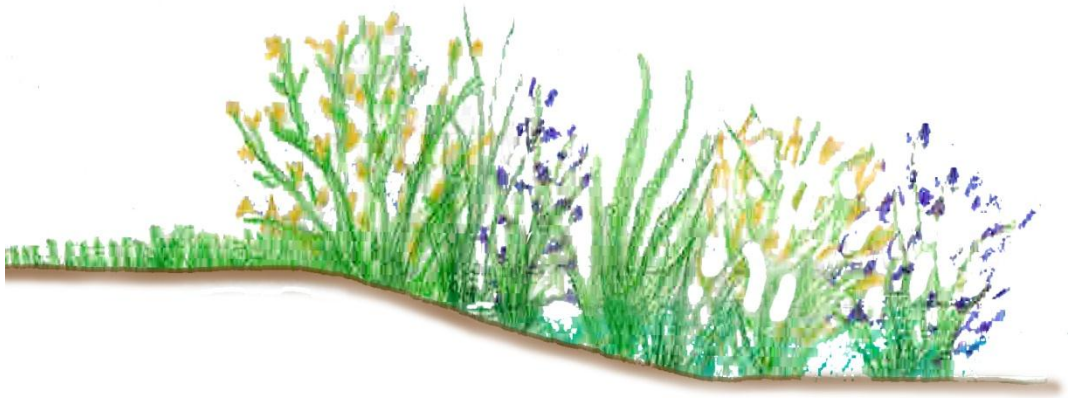
Philadelphia Water Department

Green City, Clean Waters

Plant Selection Plant Maintenance



Rachel Ahern & Katie Shafe

Overview

- Introduction to Green City, Clean Waters
- Challenges of Green City, Clean Waters
- Potential Research Topics

GREEN CITY, CLEAN WATERS

The City of Philadelphia's Program for Combined Sewer Overflow Control
$2.4 Billion Investment over the next 25 years

Green Stormwater Infrastructure

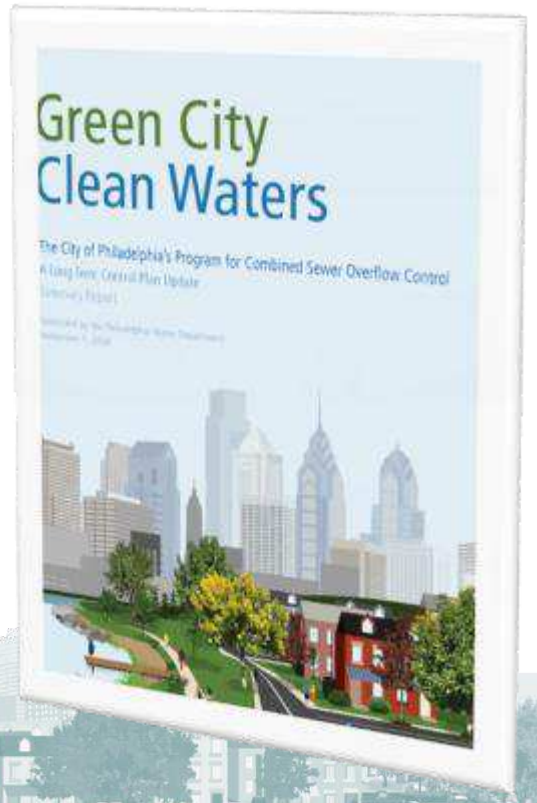
$1.67 billion

Traditional Infrastructure

$345 million

Adaptive Management

$420 million



OUR GOAL: 9,500 IMPERVIOUS ACRES CONVERTED TO "GREENED ACRES"

- Enforce strong stormwater **regulations** on development
- Create stormwater **billing** structure that rewards good practices
- Direct eight innovative **Green Programs** to invest in green stormwater infrastructure

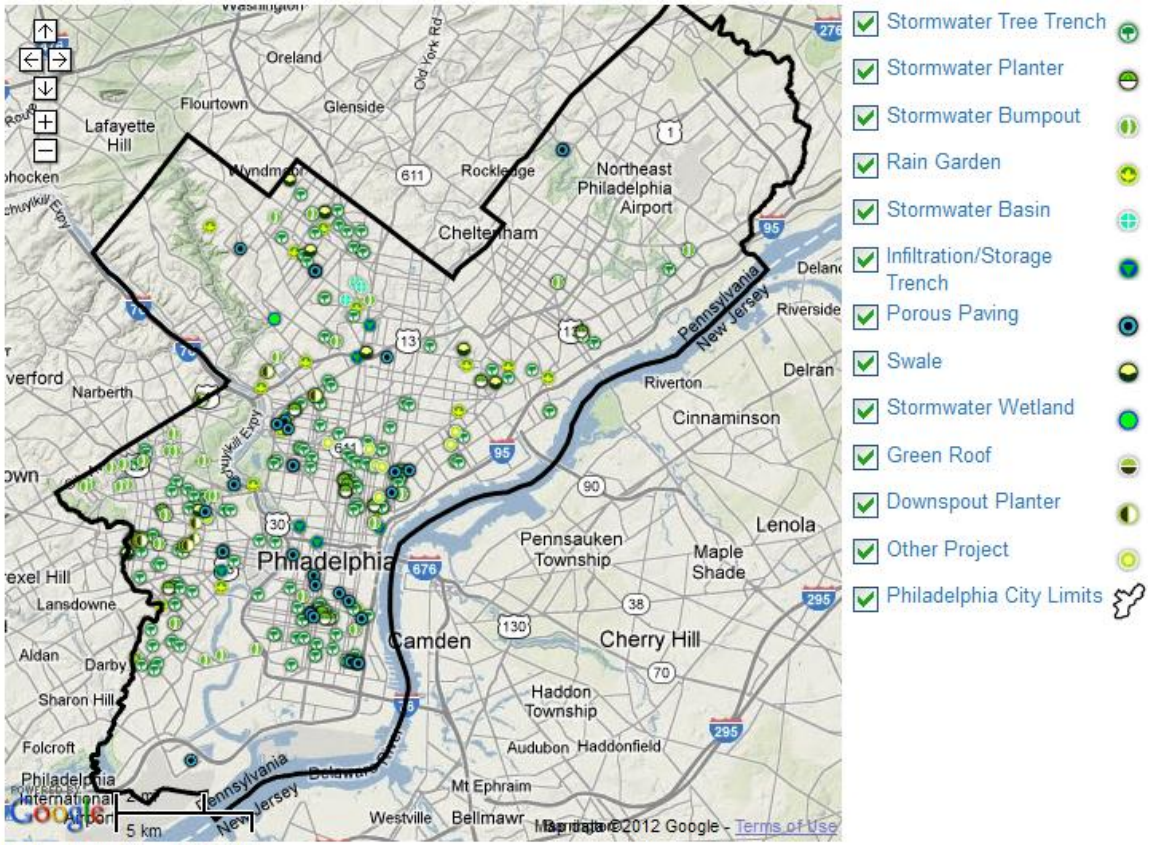
NEW INITIATIVES:

First Five Years

- Green Streets
- PWD Facilities
- Green Campus Initiatives
- Green Schools and Schoolyards
- Greening of Publicly owned Parking Facilities
- Vacant Lands
- Green Homes

Challenges of PWD's GCCW Program

- Maintenance schedule
  - **30 sites, over 60 SMPs**
- Urban stressors
- System stressors



Last update: May 31, 2012

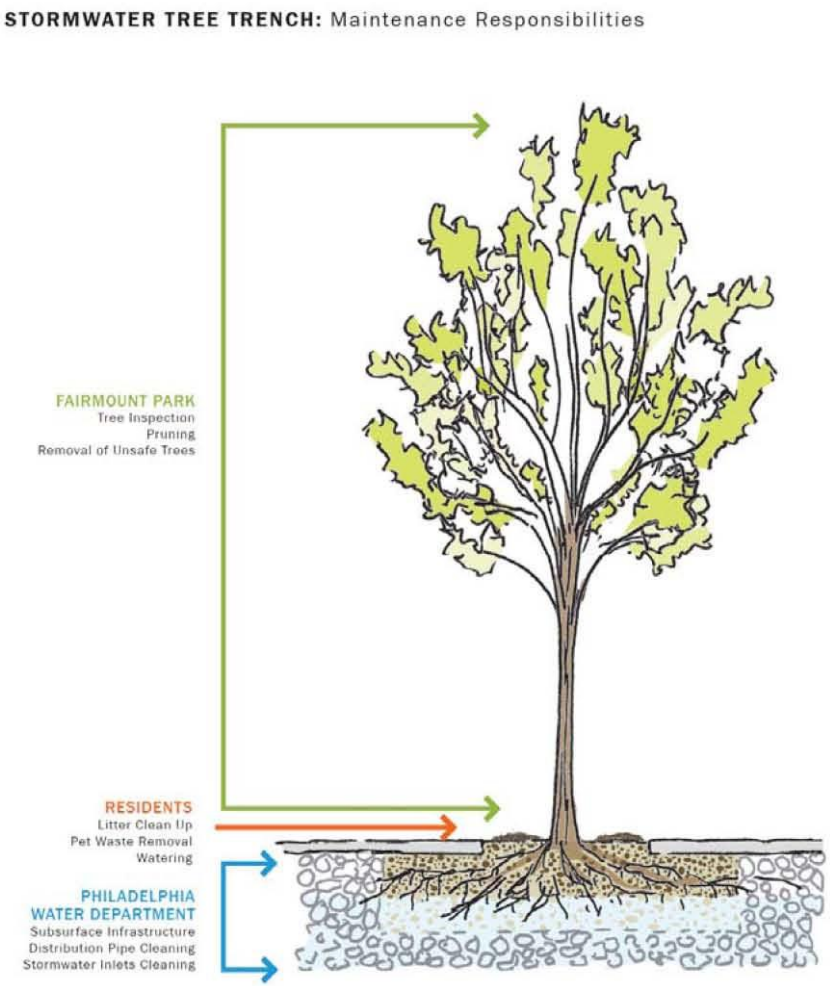
Challenges of PWD's GCCW Program

- **Maintenance schedule**
  - watering
  - weeding, pruning
  - reseeding
  - trash & sediment
  - erosion control
  - structural repairs

Green Infrastructure Maintenance Manual

Delivery: June 1, 2014

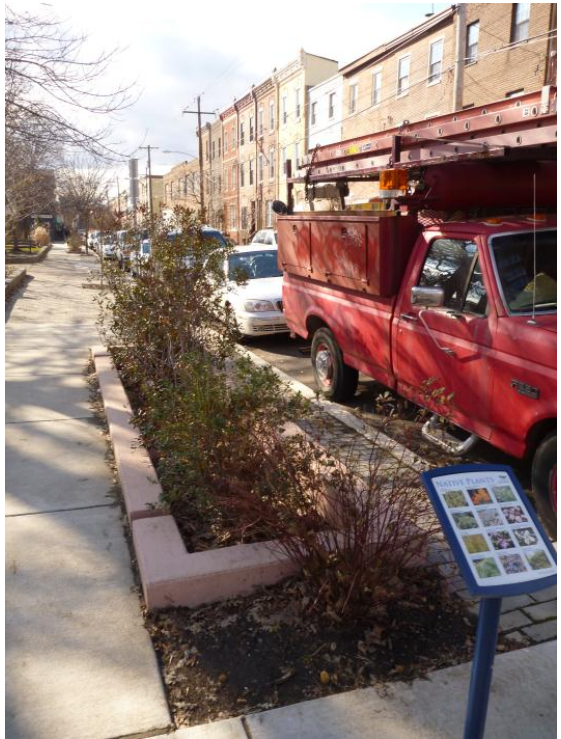
Metric: Greened Acres



Defining maintenance activities, frequency and efficiencies for long-term success of each type of green stormwater infrastructure

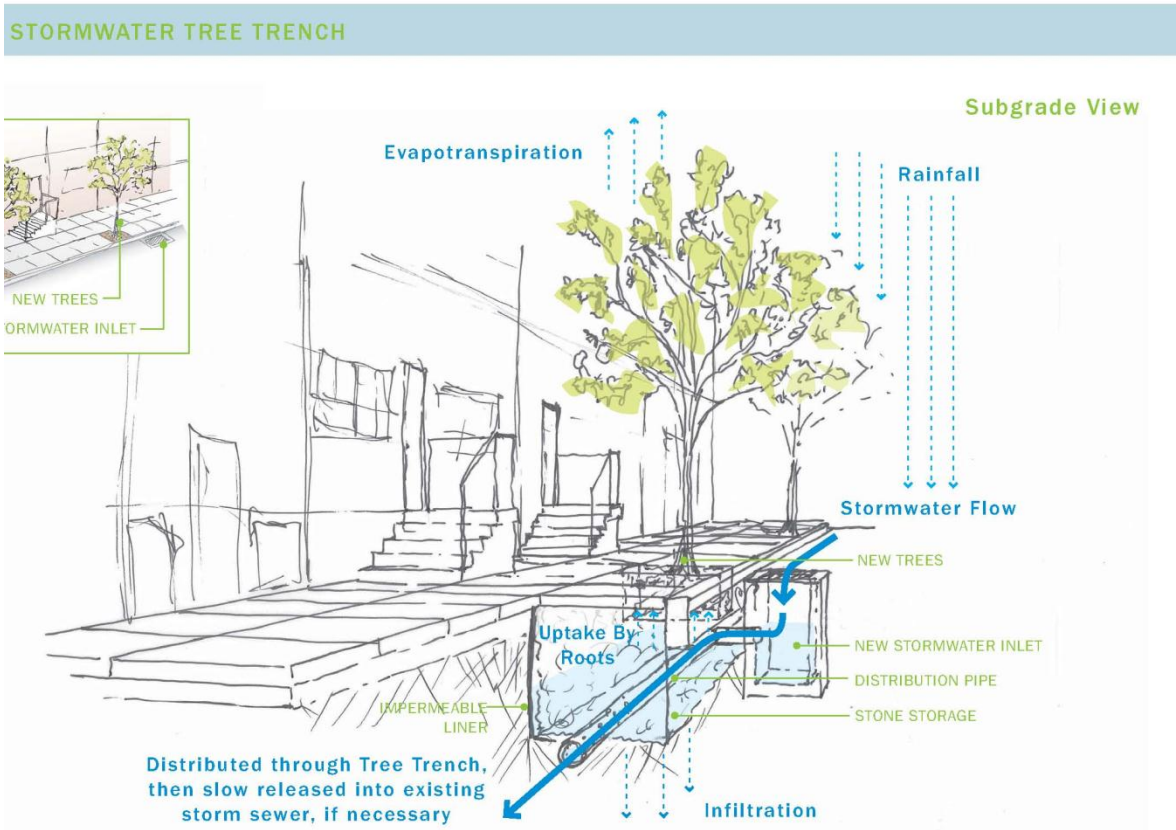
Challenges of PWD's GCCW Program

- Maintenance schedule
- **Urban stressors**
  - **heat**
  - **drought**
  - **inundation**
  - **road salts**
  - **pollutants**
  - **vandalism**



Challenges of PWD's GCCW Program

- Maintenance schedule
- Urban stressors
- **System stressors**
  - **stone beds**
  - **space constraints**
  - **bioretention soil mixes**



Challenges of PWD's GCCW Program

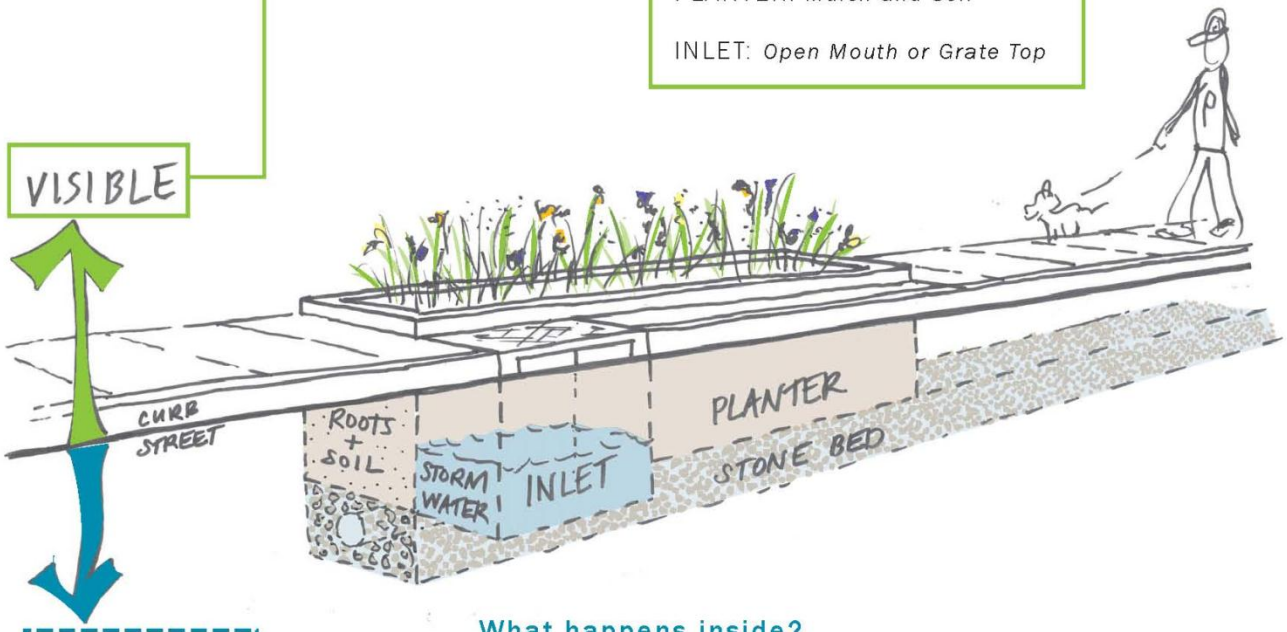
GREEN STREETS: STORMWATER PLANTER

What does it look like?

PLANTS: *Grasses and Perennials*

PLANTER: *Mulch and Soil*

INLET: *Open Mouth or Grate Top*



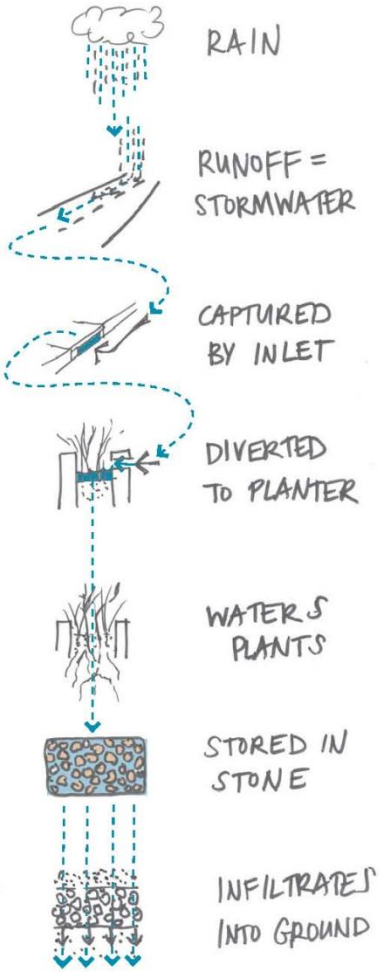
What happens inside?

ROOTS: *Absorb Stormwater to Feed Plants*

SOIL: *Cleans Stormwater as it Passes Through*

STONE: *Stores Stormwater During Peak Storms*
Spreads Stormwater Across a Bigger Infiltration Area

How does it work?



Potential Research Topics

- Causes of mortality
- Moisture levels
- Evapotranspiration rates
- Native vs. “weedy” non-native
- System design

Potential Research Topics

- **Causes of mortality**
  - **Stressors (salts, drought, or heat)**
  - **"Age" systems with extraordinarily high**
  - **Variation among species**

Potential Research Topics

- Causes of mortality
- **Moisture levels**
  - **soil types, stratification + moisture rete**
  - **susceptibility to diseases/pests**

Potential Research Topics

- Causes of mortality
- Moisture levels
- **Evapotranspiration rates**
  - **estimating for different species**

Potential Research Topics

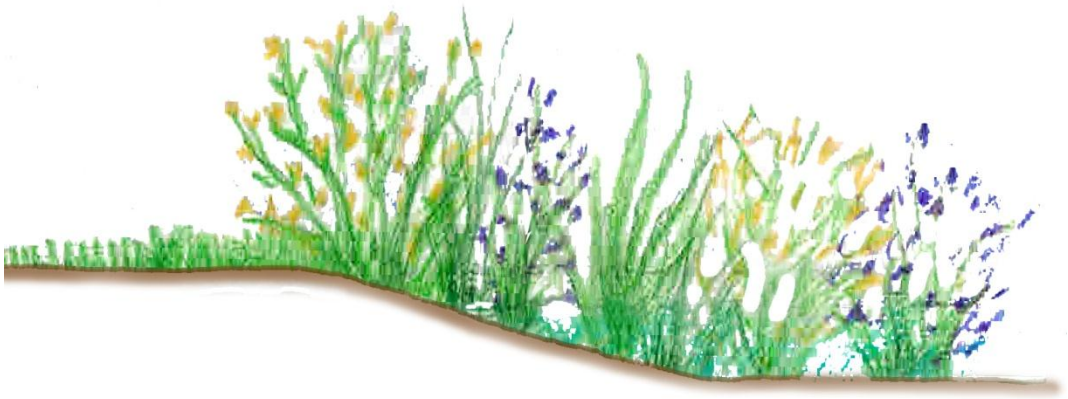
- Causes of mortality
- Moisture levels
- Evapotranspiration rates
- **Native vs. "weedy" non-native**
  - **public acceptance**
  - **ecology**

Potential Research Topics

- Causes of mortality
- Moisture levels
- Evapotranspiration rates
- Native vs. "weedy" non-native
- **System design**
  - **spatial interaction of stormwater with p**
  - **intercepting pollutants**

Potential Research Topics

- Causes of mortality
- Moisture levels
- Evapotranspiration rates
- Native vs. “weedy” non-native
- System design



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